

Abstract for 7th International Symposium on Amphibian and Reptilian Endocrinology and Neurobiology (ISAREN)

July 11-13, 2011

Ann Arbor, MI

Presentation Type: Platform

DEVELOPMENTAL TRENBOLONE EXPOSURE AFFECTS ADULT BREEDING BEHAVIOR, FECUNDITY AND MORPHOLOGY OF *XENOPUS TROPICALIS*

Robert A. Miranda(1), Allen W. Olmstead(2), Lindsey S. Blake(2), Sigmund J. Degitz(2), David R. Garcia(1), Atilade A. Owolabi(1), Catherine R. Propper(1)

(1) Department of Biological Sciences, Northern Arizona University, Flagstaff, AZ, U.S.A.

(2) Mid-Continent Ecology Division, US Environmental Protection Agency, Duluth, MN, U.S.A.

Trenbolone acetate is a synthetic androgen used as a growth promoter in the cattle industry. Its metabolite 17 β -trenbolone (17 β -T) has been detected downstream from cattle feedlots. It could be a concern to wildlife near these areas as previous studies show 17 β -T exposure affects reproductive endpoints in fishes. This study evaluated the impact of developmental aqueous exposure to 17 β -T on adult breeding behavior, fecundity and morphology in the Western clawed frog, *Xenopus tropicalis*. Tadpoles were exposed to 17 β -T (0, 3.7, 11, 33 or 100 ng/L) in 4 L of water using a flow-through system until metamorphosis then raised to adulthood in clean water. Breeding trials, using pairs within exposure levels (n=10; n=9 for 100 ng/L), were conducted to evaluate the number and viability of eggs released. None of the females in the 100 ng/L treatment and only one female from the 33 ng/L treatment released eggs. There was no difference in the number of eggs released and the proportion of eggs that were viable among the control and two lower exposure treatments. Breeding behaviors from the trials were also filmed and evaluated. During the first three hours of behavior observation, there was a difference among exposure levels for the number of male clasp attempts (Kruskal-Wallis: p=0.048) and time frogs spent in amplexus (Kruskal-Wallis: p=0.009). Frogs were then euthanized and tissues were collected to evaluate morphological endpoints and brain gene expression. Males and females did not differ in body size, or body mass specific liver or gonad weight. Females had higher mass-specific kidney weights in the 3.7 ng/L treatment (ANOVA: p=0.017). Both males and females trended towards higher fat body masses across treatments. Females exposed to 100 ng/L 17 β -trenbolone did not develop oviducts. Our results demonstrate that developmental exposure to 17 β -T impacts reproduction in an aquatic vertebrate by acting at multiple endpoints.